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(54) **Process for the production of composite molded articles.**

(57) Disclosed is a process for the production of an integral composite molded item comprising

- (i) a surface portion (c) comprising a synthetic resin phase containing a fibrous reinforcing material,
- (ii) a core portion (a) comprising the synthetic resin phase containing bubble-containing particles, and
- (iii) a separation layer (b) positioned between the surface portion and the core portion,

the process comprising the steps of:

- (a) providing in a substantially sealed mold (1) a separation layer which does not substantially pass therethrough expandable particles or compressed lightweight particles of an elastic material but which is capable of passing a synthetic resin or its precursor that is liquidized at the time of molding;
- (b) providing the synthetic resin or its precursor in the mold;
- (c) arranging a fibrous reinforcing material (3)

between the separation layer and the mold, integrated with the separation layer or separately but associated therewith;

(d) providing an aggregate of the expandable particles (4) and/or compressed particles of the lightweight elastic material on a side of the separation layer opposite to the side of an inner surface of the mold;

(e) causing volume expansion of the aggregate by elevation of temperature to thereby expand the expandable particles or relieving compression urged on the compressed lightweight particles to thereby expand the lightweight particles;

(f) flowing the liquidized synthetic resin or its precursor through the separation layer to spread it over between the separation layer and the mold, and among the expanded particles, or among the particles of the lightweight elastic material, while pressing the separation layer onto the inner surface of the mold as the result of volume expansion in the step (e) above;

**EP 0 407 996 A3**

(g) completing formation-solidification or solidification of the synthetic resin to form a surface portion and a core portion; and

(h) taking out the resulting composite molded item.

The type of the resin and the type of bubble-containing particles may be selected and combined differently.



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## EUROPEAN SEARCH REPORT

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EP 90 11 3245

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-4 025 686 (E M ZION) * column 5, line 58 - column 7, line 64 *** column 8, line 8 - line 18 ** - - -	1,2,4-9, 19,21-26, 30,31	B 29 C 67/20 B 29 C 67/22 B 29 C 67/12 B 29 C 67/14 B 29 C 67/18
A	US-A-4 040 165 (J D MIESSLER ET AL) * column 2, line 58 - line 66 *** column 3, line 18 - line 61 ** - - -	1-5	
A	EP-A-0 247 708 (EX-CELL-O CORPORATION) * the whole document ** - - -	1-5,20	
P,A	WORLD PATENTS INDEX LATEST DERWENT PUBLICATIONS LTD, London, GB AN 90-040135 [06] , DW9006 & JP-A-1316236 (TEIJIN) 21 December 1989 - - -	1-5	
D,A	EP-A-0 272 359 (M WARE) * the whole document ** - - - - -		
The present search report has been drawn up for all claims			
Place of search		Date of completion of search	Examiner
The Hague		28 October 91	PHILPOTT G.R.
<b>CATEGORY OF CITED DOCUMENTS</b> X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons ----- &: member of the same patent family, corresponding document			